R17 Regulation *Subject code: 1E2AE*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

B.Tech I Year II Semester Regular Examinations, September 2023

Basic Electrical and Electronics Engineering

(Common to CE & ME)

Maximum Marks: 70 Date:25.09.2023 Duration: 3 hours

Note: 1.This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10x2M=20 Marks)

1 What are the dependent and independent sources?
2 State Kirchoff's Voltage law.
3 State the thevenin's theorem.
4 What is Q-factor?
5 Define and classify the semiconductor diodes.
6 Draw the V-I characteristic of a Zener diode.
7 Distinguish between half wave and full wave rectifiers?
8 Draw the circuit diagram of π-section filter?
9 How a BJT acts as a current amplifier.
10 Compare FETand MOSFET.

Part-B

Answer All the following questions. (10MX 5=50Marks)

11 An Impedance $z_1 = (6 + j8)\Omega$ is connected in series with a parallel combination of impedances $z_2 = (10 + j6)\Omega$, $z_3 = (8 - j10)\Omega$ and is connected to a 200V, 100Hz supply. Find the total active power, reactive power and power factor of the circuit. [10 M]

OR

12 Derive the expressions for the peak factor and form factor of sinusoidal signal. [10M]

13 Calculate the load current in the following circuit using Millman's Theorem. [10M]

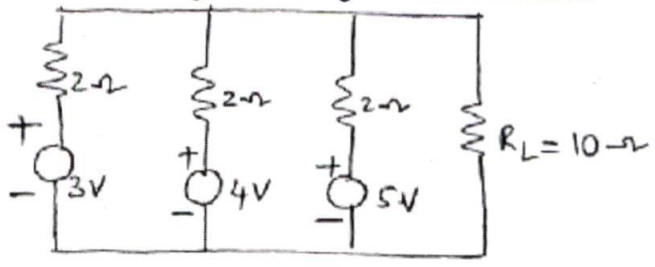

Figure: 1

OR

14 Find the value of RL that will absorb the maximum average power for the circuit shown in Figure 2. Calculate that power. [10 M]

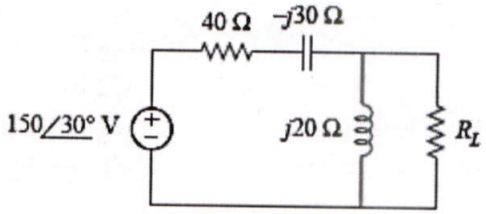

Figure: 2

15 A. Draw the V-I characteristics of P-N junction diode and explain. [5 M]
B. A single-phase full wave rectifier operates from 230V, 50 Hz supply. The load resistance is 10Ω. Draw the wave forms of all the diode currents and represent the values. [5 M]

OR

16 Draw the V-I characteristic of SCR and explain its operation, and Indicate Holding & latching Current in V-I Characteristic. [10 M]

17 Explain the Bridge rectifier with neat waveforms. [10 M]

OR

18 Derive an expression for ripple factor and efficiency of a full wave rectifier without filter. [10M]

19 Determine the h-parameters from the characteristics of BJT in CC configuration. [10 M]

OR

20 Draw the h-parameter equivalent circuit of BJT in CE configuration. Derive expressions for and Zi. [10 M]